American Fern Journal 102(2):161–166 (2012)

A New Species and a New Hybrid in the Grammitid Fern Genus *Stenogrammitis* (Polypodiaceae)

PAULO H. LABIAK

Universidade Federal do Paraná, Departamento de Botânica, Caixa Postal 19031, 81531-980, Curitiba-PR, Brazil, e-mail: plabiak@ufpr.br

ABSTRACT.—A new species and a new hybrid in the genus *Stenogrammitis* are here described, and descriptions, illustrations, and comments on the most similar species are provided. *Stenogrammitis brevipubens* is characterized by having hemidimorphic laminae, with the fertile portion narrower and less dissected than the sterile portion, and by its indument, which is composed of simple, hyaline, and 2-celled hairs that are appressed upon the petiole, rachis, and laminar tissue. The hybrid, *Stenogrammitis* ×*guatemalensis*, has hemidimorphic laminae and reddish, 1-furcate and 3-celled hairs that are spreading on the petiole and lamina. Based on the hybrid morphology, the putative parents are *S. prionodes* and *S. limula*.

KEY WORDS.—diversity, Guatemala, hybridization, Panama

Stenogrammitis Labiak is a pantropical genus recently segregated from *Lellingeria*. It comprises about 25 species, of which 12 are currently known from the Neotropics, six species from the continental Africa, four from Madagascar, and three that occur in some Islands of the Atlantic and Pacific Oceans (Labiak, 2011). The genus is characterized by its small size and narrow laminae (fronds generally less than 10 cm long and 0.5 cm wide), clathrate and iridescent rhizome scales that are glabrous throughout or with only one apical cilium, laminae with only one sorus per segment, and fertile veins that present the sclerenchyma visible beneath the sporangia.

Phylogenetic studies (Labiak *et al.*, 2010; Ranker *et al.*, 2010) showed that *Stenogrammitis* is most closely related to *Lellingeria* A. R. Sm. & R. C. Moran and *Melpomene* A. R. Sm. & R. C. Moran. *Lellingeria* differs by having broader laminae (usually more than 1 cm wide), rhizome scales that are usually ciliate, multiple sori per segment (except for *L. militaris* that has one), and fertile veins not visible beneath the sporangia (Labiak, 2011). *Melpomene* differs by presenting reddish setae on the fronds and also by rhizome scales with papillate apex (Lehnert, 2008; Labiak, 2011).

While studying the Neotropical species of *Stenogrammitis* I found a new species and a new hybrid that deserve recognition, which I describe as follow.

Stenogrammitis brevipubens Labiak, ***sp. nov.*** TYPE.—PANAMA. Prov. de Panamá: Cerro Jefe, cabecera del Río San Cristobal, 900 m, 27 Dec 1986, *I. Valdespino et al. 268* (holotype: US; isotype PMA). **Fig. 1. A–E**

Species *Stenogrammitidi myosuroidi* similaris, sed pilis brevibus, indivisis (vs. furcatis), hyalinis (vs. subrubris) differt.

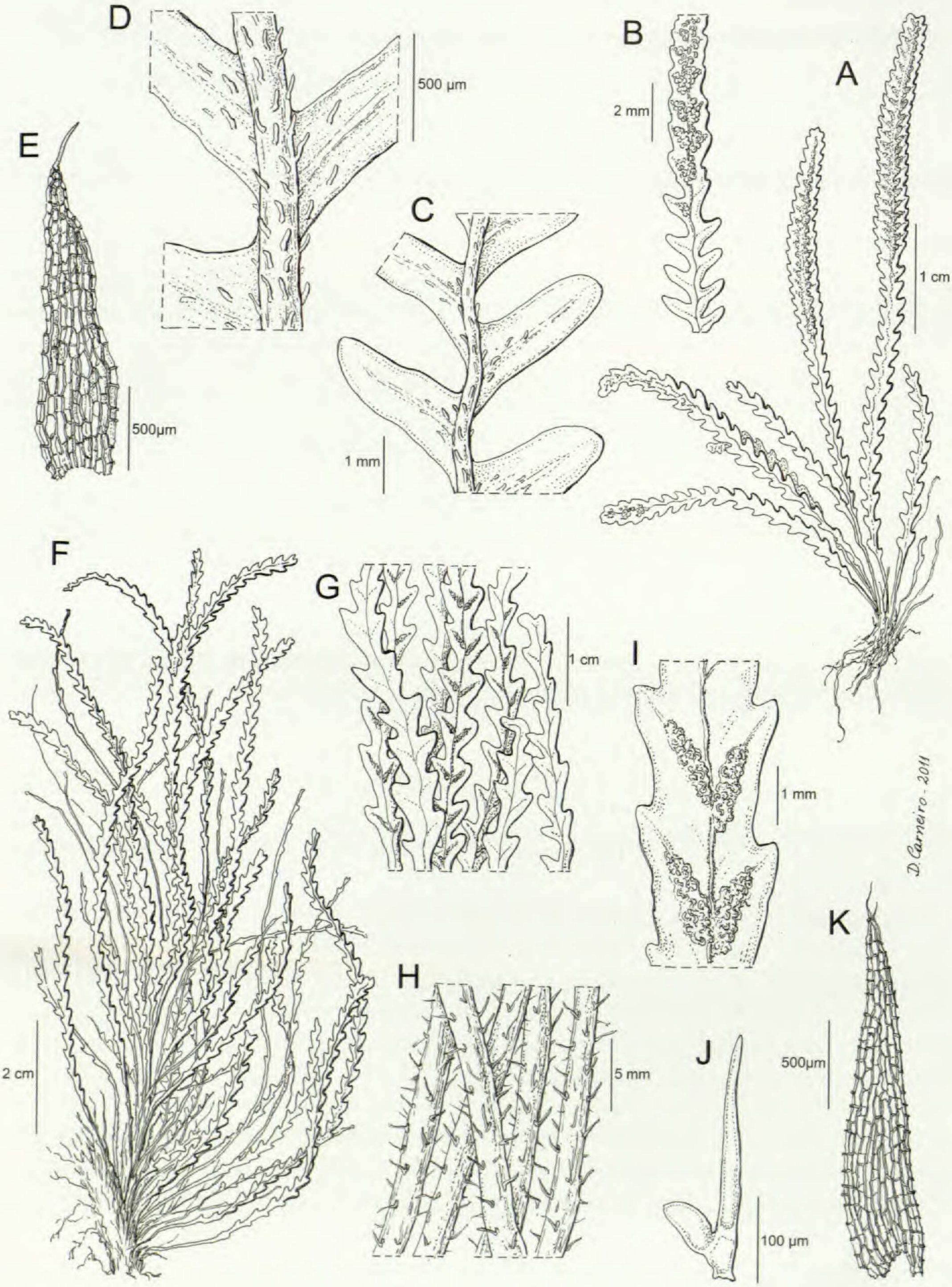

FIG. 1. **A–E**. *Stenogrammitis brevipubens* (all from the holotype). **A.** Habit. **B.** Detail showing the hemidimorphic lamina. **C.** Detail of the segments from the sterile portion. **D.** Detail showing the hairs on the abaxial surface. **E.** Rhizome scale. **F–K**. *Stenogrammitis* ×*guatemalensis* (all from the holotype). **F.** Habit. **G.** Detail of the segments. **H.** Petioles showing the hairs. **I.** Detail of the fertile portion of the lamina. **J.** Furcate hair from the laminar tissue. **K.** Rhizome scale.

Plants epipetric; rhizome short creeping, radially symmetrical, scaly, the scales lanceolate, castaneous, clathrate, 1.5–2 mm long, glabrous or with a single apical cell, the cells in the medial portion isodiametric to elongate (two or three times longer than wide); petiole 0.5–1 cm × 0.3 mm, dark brown, slightly pubescent, the hairs hyaline, soft, straight, 2-celled, simple, appressed; lamina 2–5 cm long, erect or slightly arcuate, linear, chartaceous, hemidimorphic; sterile portion deeply pinnatisect, abruptly reduced at the base, the basal segment decurrent, but not ending in a long and narrow wing to the petiole base, the segments at the medial portion 1.8–2 × 0.5–0.7 mm, linear, set at 70–80° to the rachis, symmetrical or slightly asymmetrical at the base, the apex acute to obtuse, laminar tissue and veins slightly pubescent on both sides, the hairs hyaline, 1 or 2-celled, simple, appressed, margin glabrous; fertile portion slightly crenulate, cut ca. 1/5 the way to the rachises, equal to or shorter than the sterile portion; rachis with dark sclerenchyma exposed abaxially, covered by the laminar tissue adaxially, flexuous, pubescent, the hairs hyaline, soft, 0.1 mm long, 2-celled, simple, appressed; sinuses as broad as the width of the segments; veins simple, not visible in the sterile portion, the dark sclerenchyma slightly exposed in the fertile portion beneath the sporangia, adaxially with linear, well-marked hydathodes; sori inframedial, rounded to oblong, indistinct, confluent when mature, extending beyond the bases of the sinuses and the rachis, slightly sunken, leaving an impression on the laminar upper surface; sporangia glabrous; spores green, trilete.

ETYMOLOGY.—The specific epithet *"brevipubens"* refers to the short hairs that are present on the petiole, rachis, and laminar tissue, which are the main character that helps to distinguish this species from its congeners.

DISTRIBUTION.—*Stenogrammitis brevipubens* is known by a single collection from Panama.

Stenogrammitis brevipubens is characterized by having a hemidimorphic lamina, flexuous rachis, and hyaline, simple, soft, straight, 1 or 2-celled, and appressed hairs present on the petiole, rachis and laminar tissue. Among the species with hemidimorphic lamina *S. myosuroides* (Sw.) Labiak and *S. jamesonii* (Hook.) Labiak are the most similar species, which can be distinguished by having straight (or only slightly flexuous) rachis and reddish, furcate, 3–4-celled, spreading hairs. Furthermore, *S. brevipubens* is an epipetric species, whereas *S. myosuroides* and *S. jamesonii* are usually epiphytes.

Another Neotropical species that also present simple and hyaline hairs on the petiole and rachis is *S. pumila* (Labiak) Labiak, from southeastern Brazil. It differs from *S. brevipubens* by its monomorphic lamina.

CONSERVATION STATUS.—This species is currently known by a single collection, but with several individuals present in the type collection. This suggests that it might have a very narrow distribution but may form a dense population on the rocks of Cerro Jefe. Therefore, according to IUCN Red List Criteria (IUCN, 2001), it is assessed here as Data Deficient (DD).

Stenogrammitis* ×*guatemalensis Labiak, **hybrid nov.** TYPE.—GUATEMALA. Depto. Alta Verapaz: Mun. Cobán Chicu'sha'b, 8 km al SW de Cobán, 15°26′N, 90°27′W, 22 Jul. 1988, *P. Tenorio et al. 14729* (holotype: MO). **Fig. 1. F–K**

Hybrida inculta e *Stenogrammitide prionode* et *S. limula* genita. Plantae epiphyticae; rhizoma erectum, paleis brunneis, iridescentibus. Frondes fasciculatae; petioli setis brevibus, furcatis vestiti; laminae pro partibus sterilibus pinnatisectae; segmenta deltata vel deltato-linearia, nervis indivisis; sori lineares, impressi.

Plants epiphytic; rhizome erect, radial, scaly, the scales lanceolate, dark brown, iridescent, clathrate, 1–1.4 mm long, glabrous or with a single and furcate cilium at the apex, the cells in the medial portion isodiametric; petiole 0.5–1.5 cm × 0.3 mm, dark brown, slightly pubescent, the hairs spreading, reddish, rigid, straight, 3-celled, 1-furcate; lamina 10–15 cm long, arcuate, linear, chartaceous, slightly hemidimorphic; sterile portion deeply pinnatifid to pinnatisect, gradually reduced at the base, basal segment long-decurrent, ending in a long and narrow wing to the petiole base, the segments at the medial portion 1.5–2 × 1–1.5 mm, deltate to linear-deltate, set at 70–80° to the rachis, symmetrical to slightly asymmetrical at the base, the apex obtuse, laminar tissue, veins, and margins glabrous; fertile portion pinnatifid, cut ca. 1/3 the way to the rachises, about as long as the sterile portion, the segments deltate, obtuse; rachis on both sides with dark sclerenchyma exposed, pubescent, the hairs spreading, reddish, rigid and straight, 1-furcate,ca. 0.2 mm long; sinuses equal to or broader than the width of the segments; veins simple, not visible in the sterile portion, but with the dark sclerenchyma exposed in the fertile portion beneath the sporangia, adaxially with linear, well-marked hydathodes; sori inframedial, linear, distinct, not extending beyond the bases of the sinuses and the rachis, sunken, leaving an impression on the laminar upper surface; sporangia not well formed; spores not seen.

ETYMOLOGY.—The epithet *"guatemalensis"* refers to the type locality where the hybrid was found: Guatemala.

DISTRIBUTION.—*Stenogrammitis* ×*guatemalensis* is known only from the type collection from Guatemala.

Stenogrammitis ×*guatemalensis* is known by a single collection, which suggests a sporadic event of hybridization. Based on its intermediate morphology, the most probable parents are *Stenogrammitis limula* (H. Christ) Labiak and *S. prionodes* (Mickel & Beitel) Labiak, two of the commonest species of *Stenogrammitis* in Guatemala.

With *S. limula* it shares reddish, rigid, straight and 1-furcate hairs on the petiole and rachis, rhizome scales with isodiametric cells, and also linear and sunken sori that leave an impression on the adaxial surface of the lamina. It differs from *S. limula* by its slightly hemidimorphic lamina (vs. monomorphic), and longer rhizome scales (1–1.4 vs. 0.8–1.2), characters that are shared with *S. prionodes*.

TABLE 1. Comparison of the main characters that distinguish the species of *Stenogrammitis* known to Guatemala, and the hybrid.

	Leaf dimorphism	Rhizome scales length	Cells of the rhizome scales	Sori
S. limula	monomorphic	0.8–1.2 mm	isodiametric	linear and sunken, distinct
S. prionodes	hemidimorphic	2–3 mm	elongate	roundish and superficial, distinct
S. jamesonii	hemidimorphic	1.5–2 mm	isodiametric to elongate	confluent at maturity, indistinct
S. × *guatemalensis*	slightly hemidimorphic	1–1.4 mm	isodiametric to elongate	linear and sunken, distinct

Other than *Stenogrammitis limula* and *S. prionodes*, the only other species of *Stenogrammitis* known to Guatemala is *S. jamesonii* (Hook.) Labiak. Like *S. prionodes*, it also has a hemidimorphic lamina, and reddish and furcate hairs on the petiole and rachis. However, its fertile portion is shallowly crenulate, and the sori are conspicuously confluent when mature—characteristics that are not present in the hybrid. A summary of characters useful for distinguishing the species and hybrid of *Stenogrammitis* known from Guatemala is presented in Table 1.

Although hybridization is a common event among some groups of terrestrial ferns (e.g., *Anemia, Blechnum,* and *Dryopteris*), it seems to be very rare and occasional among epiphytic plants (Gómez, 1985). Records of hybrids among the Grammitid ferns are scarce in the literature and, as far as I know, only four cases have been reported so far (Parris, 1977; Parris, 1984; Labiak and Matos 2007; Christenhusz, 2009). Therefore, because it is an uncommon event among the Grammitid ferns, I consider it worthwhile to recognize this hybrid, even though it is represented by only a few individuals.

ACKNOWLEDGMENTS

This study was funded by a grant from the CNPq—Brazil (CNPq Proc. n° 301997/2010-1). I thank The New York Botanical Garden for providing herbarium and laboratory facilities, as well as the Curators of the following herbaria for loans: AAU, B, BM, BR, F, FR, GH, K, MAPR, MICH, MO, NY, P, PMA, S, SP, U, UC, US, and WU. I also thank Robbin Moran, John Mickel, Alejandra Vasco, and Michael Sundue for their help during my visit to NY. Diana Carneiro prepared the line drawings.

LITERATURE CITED

CHRISTENHUSZ, M. 2009. Index Pteridophytorum Guadalupensium or a revised checklist to the ferns and club mosses of Guadeloupe (French West Indies). Botanical Journal of the Linnean Society 161:213–277.

GÓMEZ, L. D. 1985. Ecology of some neotropical hybrid pteridophytes. Proceedings of the Royal Society of Edinburgh 86B:347–351.

IUCN. 2001. Red List Categories and Criteria, Version 3.1. Prepared by the IUCN Species Survival Commission, IUCN, Gland, Switzerland, and Cambridge, United Kingdom.

LABIAK, P. H. 2011. *Stenogrammitis*, a new genus of Grammitid Ferns segregated from *Lellingeria* (Polypodiaceae). Brittonia 63:139–149.

LABIAK, P. H. and F. B. MATOS. 2007. A new hybrid and two new combinations in neotropical grammitid ferns. Brittonia 59:182–185.

LABIAK, P. H., M. SUNDUE and G. ROUHAN. 2010. Molecular phylogeny, character evolution and biogeography of the grammitid fern genus *Lellingeria* (Polypodiaceae). American Journal of Botany 97:1354–1364.

LEHNERT, M. 2008. Eleven new species in the Grammitid fern genus *Melpomene* (Polypodiaceae). American Fern Journal 98:214–250.

PARRIS, B. S. 1977. A naturally occurring intergeneric hybrid in Grammitidaceae (Filicales): *Ctenopteris heterophylla* ×*Grammitis billardierei*. New Zealand Journal of Botany 15:597–599.

PARRIS, B. S. 1984. Another intergeneric hybrid in Grammitidaceae: *Ctenopteris longiceps* ×*Grammitis sumatrana*. Fern Gazette 12:337–340.

RANKER, T. A., M. SUNDUE, P. H. LABIAK, B. S. PARRIS and G. ROUHAN. 2010. New insights into the phylogeny and historical biogeography of the *Lellingeria myosuroides* clade (Polypodiaceae). [Internet]. Version 48. PLoS Currents: Tree of Life. 2010 Nov 18 [revised 2010 Nov 22]:PMC2989831.